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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/537,180	03/29/2000	Donald R. Owen	WPB40219A	6869

25944 7590 04/22/2003

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EXAMINER	
SAUCIER, SANDRA E	
ART UNIT	**PAPER NUMBER**
1651	13

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/537,180	Applicant(s) Owen et al.
	Examiner Sandra Saucier	Art Unit 1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Mar 4, 2003*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *224-292* is/are pending in the application.

4a) Of the above, claim(s) *268-292* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *224-267* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *Mar 29, 2000* is/are a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claims 224-292 are pending. Claims 224-267 are considered on the merits. Claims 268-292 are withdrawn from consideration as being drawn to a non-elected invention.

Election/Restriction

Claims 268-292 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed in Paper No. 12.

The traversal is on the ground that examination of all the groups would not constitute a burden. This is not found persuasive because the examination of multiple methods which have distinct steps and end points and multiple compositions constitutes burden. Burden lies not only in the search of US Patents, but in the search for literature and foreign patents and examination and comparison of each claim's language and the specification for compliance with the statutes concerning new matter, distinctness and scope of enablement.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The amendment filed 12/5/2000 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

On pages 6, 15, 29, 30 in the paper filed 12/5/00 the insertion of "and/or fluorescent tagged copolymer".

On page 22, insertions at lines 21, 24 and 30.

On page 24, insertion at line 25.

On page 25, insertion at line 19.

On page 26, insertion at line 28.

Please either point to the place in the specification as filed where each insertion is supported or delete it.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

NEW MATTER

Claims 224-267 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 224 recites "energy levels in the organ". The SUMMARY OF THE INVENTION on page 4, where the broadest statement of the invention should be found, states that it is the "high energy nucleotide" levels and enzyme levels that are restored. This is not the same as "energy levels in the organ" which may be interpreted to be a broadening of the original disclosure. Please either point to the place in the specification where this recitation is supported or amend it so that it no longer contains new matter.

Claim 224 is broader than the original disclosure in that the first medical fluid is not required to contain oxygen as disclosed in claim 1 of the originally filed claims or on page 5 in SUMMARY OF THE INVENTION, where the broadest statement of the invention should be found, where the first medical fluid is disclosed to contain oxygen. The claims must be supported FULLY by the disclosure as filed. This does not appear to be the present case.

Claim 225 recites that the first temperature is "up to about 25°C". Please point to the place in the specification where this recitation has support. 12-24°C is seen on page 26, but not "up to about 25°C", which has a lower limit of the range at absolute zero on the Kelvin scale.

Claim 227 recites "at least about 15°C". Please point to the place in the specification where this recitation has support. Support for about 10-38°C is seen on page 26, but not " at least about 15°C". This is a broadening of the originally filed disclosure.

Claim 230 recites "about 20°C to **about** 38°C". Please point to the place in the specification where this recitation has support. Support for "about 10°C to 38°C" as an upper value is seen on page 26, but not "**about** 38°C". This is a broadening of the as filed disclosure.

Claim 232 recites "about 1°C to **about** 15°C". Please point to the place in the specification where this recitation has support. Support for "about 1°C to 15°C" as an upper value is seen on page 30, but not "**about** 15°C". This is a broadening of the as filed disclosure.

Claim 235 recites "at least about 20°C". The range claimed by this recitation is from about 20°C to infinitely hot. Please point to the place in the specification where this range is supported. Support is seen on page 26 for "about 10°C to 38°C", but not from 20°C" to infinity.

Claim 240 recites "free radical scavenger, a pituitary growth factor extract and cell culture media". Please point to the place in the specification where the first medical fluid (oxygenated fluid) is said to contain these components.

Claim 241 recites "at least one viability marker". Please point to the place in the specification where the first medical fluid (oxygenated fluid) is said to contain this component.

Claim 253 recites "antioxidants, anti-apoptic agents and agents that decrease vascular permeability". Please point to the place in the specification where the flush solution is said to contain these components.

Claim 254 recites "at least one viability marker". Please point to the place in the specification where the flush solution is said to contain this component.

Claims 261 and 263 recite "at most 15°C". Please point to the place in the specification where this recitation is supported.

Claims 262 and 264 recite "at most 10°C". Please point to the place in the specification where this recitation is supported.

Applicant is not free to introduce new elements and broaden ranges after

the filing date of the application.

INDEFINITE

Claims 228, 251-253 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 228 recites "about room temperature". This phrase is indefinite because the metes and bounds of the temperature range cannot be determined. Room temperature varies according to location and desire of the occupants. It is a relative term. Thus, the metes and bounds of the claim are not clear.

Claims 251, 252, 253 recite "hypothermic temperature". This is an indefinite phrase because the metes and bound of the term "hypothermic" are not clear. It is a relative term without a set reference point in the claim. Thus, the metes and bounds of the claim are not definite.

In claim 256, it states that after the organ has been transplanted, the organ is again perfused with the first fluid (perfluorocarbon containing). However, this does not seem clear since after transplantation, the heart is necessarily connected to the new host and is no longer connected to the perfusion apparatus. The claim makes no sense.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action: A person shall be entitled to a patent unless (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent, (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 224-245, 248-252, 258-266 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by WO 88/05261 [N].

The claims are directed to a method of maintaining and restoring the viability of an organ subjected to ischemia comprising:

perfusing the organ with a first fluid at a first temperature to maintain/restore

pre-ischemia energy levels in the organ, and

perfusing the organ with a second fluid containing substantially no oxygen at a second temperature to store/transport the organ, whereby the second temperature is lower than the first temperature.

The references are relied upon as explained below.

WO 88/05261 discloses in Example 3, a first normothermic (37°C) perfusion of a FC-43 emulsion at a pressure of 40-120mm Hg followed by a second perfusion with a hypothermic (4-6°C) electrolyte solution at a pressure of <20mm Hg. The perfusate is circulated through a pH sensor module (page 25, l. 20) which is a viability marker or indicative of the organ's viability according to the specification at page 15, l. 28. The perfusate is recycled through a recirculation loop which contains a filter (Fig 1, 16). The recycled perfusate is debubbled and oxygenated and pH regulated prior to returning to the organ. The perfusion may be continuous during storage. The organ is first removed from the subject and cooled in a saline/icewater bath (page 22, l. 10) and perfused with a cardioplegia solution prior to perfusing with the first and second solutions. The organ is stored after the second perfusion in a chamber with includes a housing and an organ supporting surface which allows effluent to pass through, the housing includes openings.

The FC-43 emulsion is an oxygen carrying solution which contains dextrose, both of which function to maintain energy levels in organs (See Ingwall et al. [U]). The solution contains oxygen and the partial pressure of oxygen is monitored during the perfusion process. Thus the solution is considered to have a viability marker as disclosed on page 6, l. 19 of the specification.

The electrolyte solution contains mannitol which is an antioxidant (See Burdon et al. [V]).

Insofar as the process relies on the use of components of the solutions which instead of being characterized by technical features suitable for the identification of a solution composition, is imprecisely defined by means of functional features which merely recite the desired result to be achieved, the subject matter is considered to be anticipated or made obvious by the

disclosures of the prior art.

Portable is a term without a reference point. Everything is portable if a large enough moving force is applied. Thus, the chamber (1) of the prior art which holds the artificial pericardial sack (2) and has inlets (51) and outlets (16) connected to the organ, can be portaged and thus the chamber is considered to be portable. That the applicants have termed the pericardial sack (2) a "cassette" is the prerogative of the inventor and as it is lacking in structural elements is of little patentable weight. Please note the artificial pericardial sack may be thrown away after use if wished, thus it may be termed "disposable". The container is capable of maintaining the organ at a temperature of 10°C at least for a short period of time because the heart has been cooled. No length of time of the "maintaining" limitation is seen. Maintaining can be for one minute, one hour, or less.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 246 and 247 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N] in view of WO 96/29864 [O]

The claims are directed to the use of a pressure source incapable of providing pressures greater than 100 mmHg or 40 mmHg.

WO 88/05261 discloses using 40-120 mm Hg pressures in normothermic perfusion and less than 20 mm Hg pressures in hypothermic perfusion. The system is equipped with a pressure release control system which is

programmable so as not to exceed a preestablished limit (page 14, ls. 1-10). Fig 4 shows the control systems. The reference lacks the disclosure of using a setting of 100 mmHg which cannot be exceeded.

WO 96/29864 discloses an apparatus used for normothermic perfusing of organs with a pressure maximum of 90 mmHg (page 23).

One of skill in the art may set the pressure in the apparatus of WO 88/05261 so that the fluid perfusion pressure can not exceed 90 mmHg as taught by WO 96/29864 because the apparatus of WO 88/05261 has variable settings which once established according to the desire of the operator will not be exceeded. One of skill in the art would be expected to able to establish maximal settings of 90 mmHg using the apparatus of WO 88/05261 and the maximal pressure settings as disclosed in WO 96/29864 in the absence of evidence to the contrary.

Clearly the apparatus is capable of operating at pressures no greater than 20mmHg also because this is the setting taught for hypothermic perfusion.

Claims 253 and 254 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N] in view of Chambers et al. [W].

The claims are directed to the use of antioxidants in the flush solution.

WO 88/05261 is relied upon as discussed above and lacks the specific teaching of the use of antioxidants in the flush/cardioplegic solution.

Chambers et al. disclose that the addition of various antioxidants to cardioplegic solutions improves organ viability.

The addition of an antioxidant to the flush, cardioplegic solution of WO 88/05261 (p. 22, l. 6) would have been obvious when taken with Chambers et al. who teach the improved viability of a heart when the flush/cardioplegic solution incorporates antioxidants.

Claims 255 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N].

The claim is directed to transplanting the organ into the recipient while

the organ remains at the second temperature which is the at temperature that it last was perfused.

While WO 88/05261 does not teach any specific temperature that the heart must be during transplantation, in the absence of evidence to the contrary, one of skill in the art may chose to transplant a cold organ or a warm one as desired.

Claim 257 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N] and Ingwall et al. [U] or WO 97/43899 [P].

The claim is direct to perfusing the organ with the first fluid at the first temperature prior to transplantation.

WO 88/05261 teaches at page 23, that it is possible to raise the temperature of the heart if there is ATP depletion prior to transplantation.

WO 97/43899 disclose that warming a heart (page 10, l. 23) and perfusing with a solution containing substrates such as glucose (page 10, l. 33) and oxygen (page 11, l. 3) reestablishes oxidative metabolism, which means that ATP levels are established (abstract and Fig. 1).

Inwall et al. teaches that ATP levels can be restored in heart when perfusion with a solution containing oxygen and glucose (abstract).

One of skill in the art, given the teaching that one should raise the temperature of the heart if there is ATP depletion (WO 88/05261), would perfuse with the first fluid at the first temperature because warm perfusion of the heart with oxygen and glucose is known to raise endogenous ATP levels and improve viability of the organ as taught by Ingwall et al. or WO 97/43899 [M].

Claims 259-266 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N] in view of US 5,586,438 [A].

The claims are directed to a method of perfusing an organ in a portable perfusion unit capable of maintaining the organ at a temperature of 10°C or less. Other claims are directed to storing the organ after perfusion with the first medical fluid at the first temperature or with the second medical fluid at

the second temperature.

The references are relied upon as explained below.

WO 88/05261 has been discussed above and lacks specific mention of portability.

US 5,586,438 discloses an apparatus for transporting and preserving organs (Fig. 3). It comprises a housing and an organ container. The apparatus can be cooled by ice or other thermal buffers or by the expansion of compressed gas. The preferred temperature of storage/transportation is 6°C (col. 9, l. 29). While the organ container is not disclosed as being disposable, anything in the absence of structural elements can be disposed of. The organ container is removable from the housing and thus, can be thrown away separate from the housing.

The use of the perfusion regimen of WO 88/05261 in the apparatus of US 5,586,438 would have been obvious because one of skill in the art may choose any perfusion apparatus in the art that will perform a specific perfusion regimen. The apparatus of US 5,586,438 is capable of performing the perfusion regimen taught in WO 88/05261 and is used for perfusion and transportation of organs for transplantation.

Further, it is well within the purview of one of skill in the art to store/transport the organ after the perfusion of any solution known in the art at any temperature used in the art in the absence of any evidence of criticality.

Claim 267 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 88/05261 [N] and US 5,586,438 [A] as applied to claims 259-266 above, and further in view of US 5,450,329 [B].

The claims are further directed to the use of a GPS to monitor the location of the organ.

WO 88/05261 and US 5,586,438 are relied upon as discussed above. The references lack mention of the use of GPS to track the organ.

US 5,450,329 discloses the use of GPS to track a vehicle.

The use of GPS to track a vehicle which is carrying the portable perfusion unit of US 5,450,329 which contains an organ perfused with the regimen of WO 88/05261 and is intended for transplantation is well within the purview of one of skill in the art because such tracking devices are known in the art.

One of ordinary skill in the art would have been motivated at the time of invention to make these substitution in order to obtain the results as suggested by the references with a reasonable expectation of success. The claimed subject matter fails to patentably distinguish over the state of the art as represented by the cited references. Therefore, the claims are properly rejected under 35 U.S.C. § 103.

No critical or novel element is seen in the claims. It appears that all elements are known in the art of transplantation.

To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1651. The supervisor for 1651 is M. Wityshyn, (703) 308-4743. The normal work schedule for Examiner Saucier is 8:30 AM to 5:00 PM Monday and Tuesday and 8:30 AM to noon on Wednesday.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra Saucier whose telephone number is (703) 308-1084. Status inquiries must be directed to the Customer Service Desk at (703) 308-0197 or (703)-308-0198. The number of the Fax Center for the faxing of official papers is (703) 872-9306 or for after finals (703) 872-9307.

Sandra Saucier
Primary Examiner
Art Unit 1651
April 11, 2003